Comprehensive species and habitat diversity assessment

- tool for setting priorities in territorial nature protection

Dušan Romportl (Silva Tarouca Research Institute)

4th Natura 2000 Biogeographical Seminar, Prague 25.06.2024

DIVLAND

T A Č R

Tento projekt je spolufinancován se státní podporou Technologické agentury ČR a Ministerstva životního prostředí v rámci **Programu Prostředí pro život.**

www.tacr.cz www.mzp.cz

DivLand - research project of complex landscape monitoring and assessment for environmental resilience

DIVLAND

Main aims of the project

- **Formation of a research centre** that will generate outputs that can be used
  - for strategic planning in the field of nature conservation, landscape and biodiversity
  - to address current issues that arise in the landscape and its ecosystems

Specific project objectives

1. development and establishment of **standardized landscape monitoring** at the level of the Czech Republic
2. assessing the **dynamics of forest ecosystems** and **agroecosystems** in the context of climate change, including the level of their **degradation**
3. proposal of a comprehensive assessment of the **biodiversity dynamics** and identification of significant threats (including **biological invasions**)
4. development of comprehensive **monitoring tools & methodological basis** for strategic decision-making
5. proposal of **management measures** to **mitigate the impacts of climate change** on landscape and ecosystems in the Czech Republic

Basic concept of the project

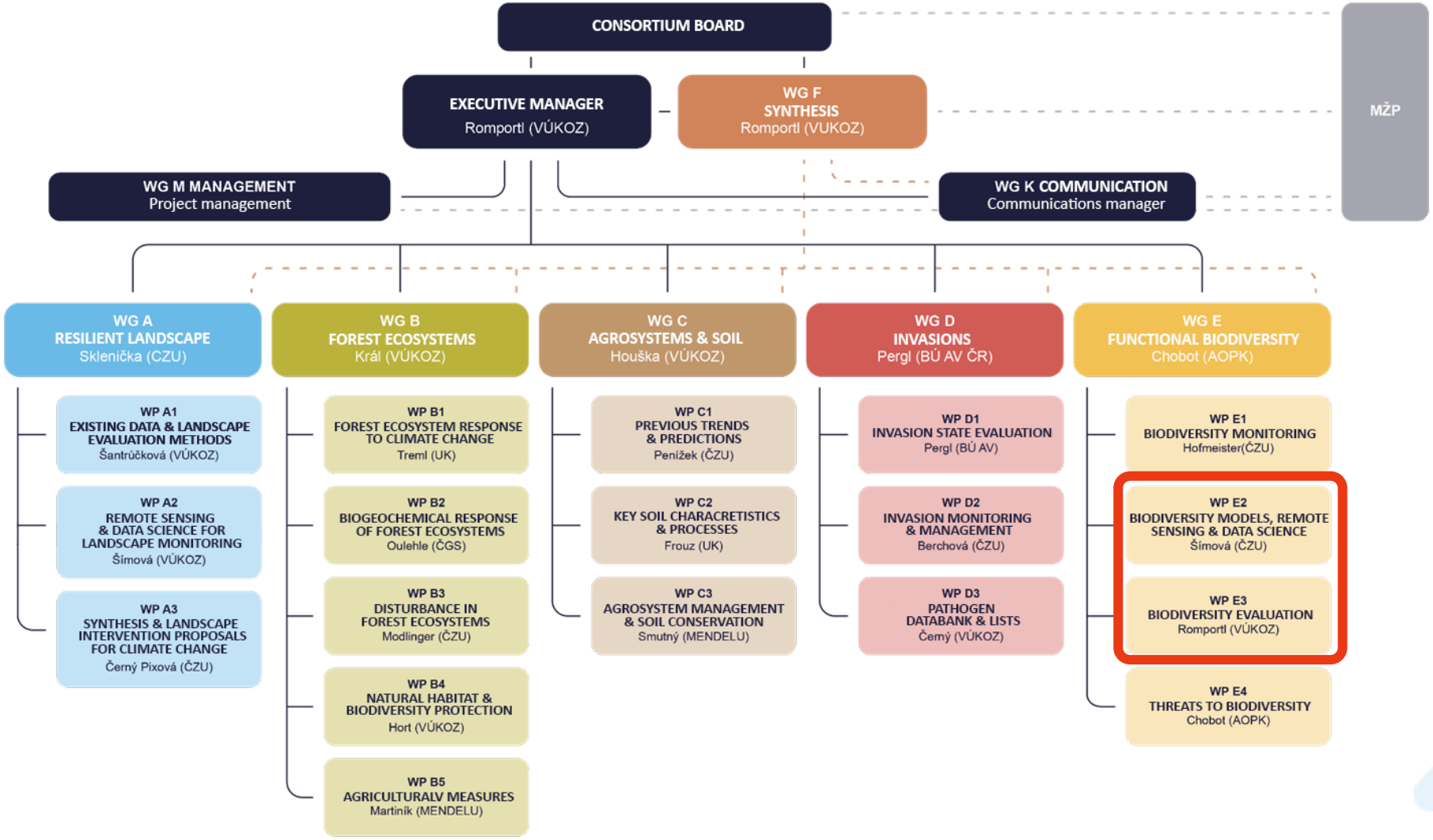
DIVLAND

- **Spatial levels of project design:**
  - **A. TERRITORY OF THE ENTIRE CZECH REPUBLIC**
  - **B. MODEL AREAS**
    - pilot sites for experimental research and applications
    - representatives of landscape types or ecosystems

- **Methodological levels of the project:**
  1. ASSESSMENT OF THE STATE AND CURRENT DYNAMICS
  2. TREND IDENTIFICATION & MODELLING / PREDICTION
  3. SYNTHESIS & DESIGN OF AGGREGATED INDICATORS
  4. PROPOSALS OF ADAPTATION / MITIGATION MEASURES
  5. RESULTS – reports, datasets, measures

Project Management & Organisation

- 5+1 Thematic Working Groups (WG) & 20 Thematic Work Packages (WP)



WP Biodiversity Monitoring & Assessment

Motivation & Aims

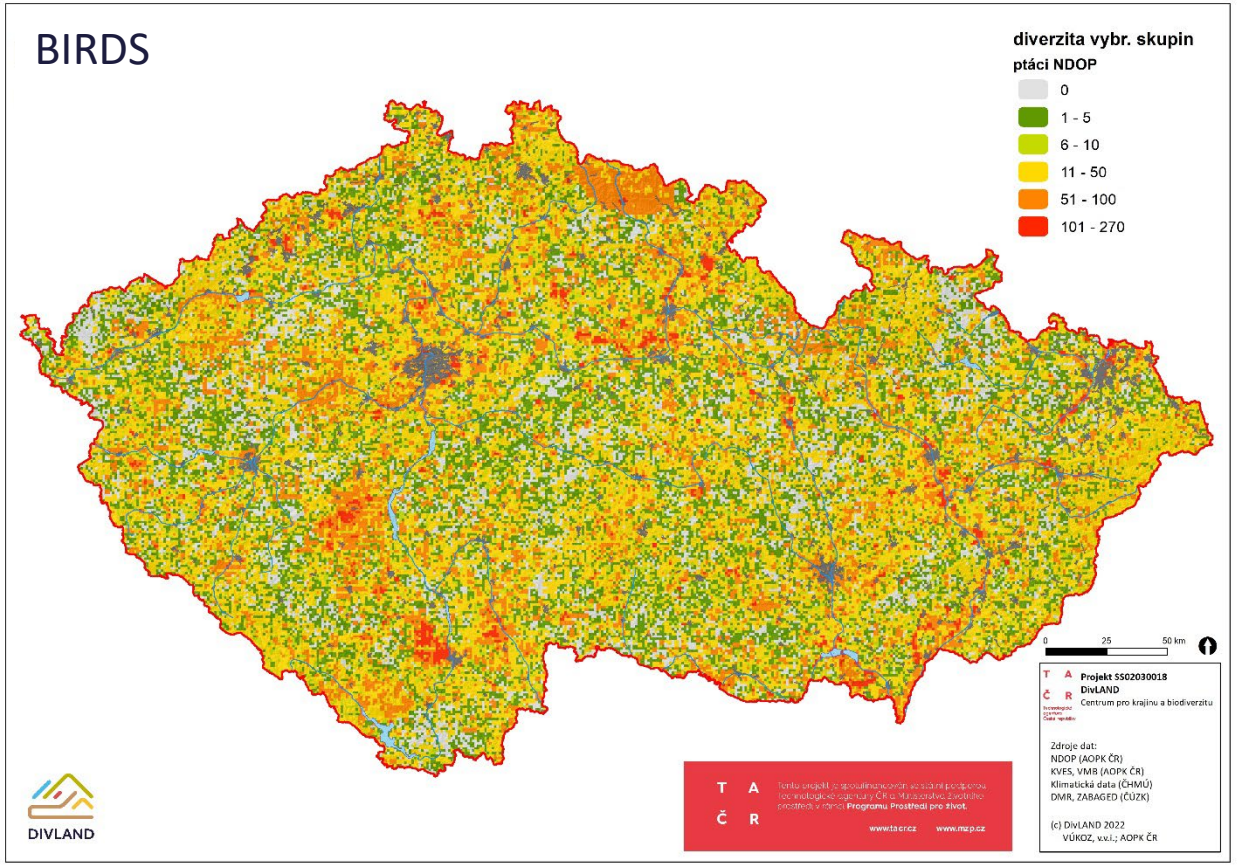
1. **to fulfill the requirements of**
   - the **European Biodiversity Strategy 2030**
   - the **Montreal Global Biodiversity Framework** (COP 15)
   - (the **Nature Restoration Law**)

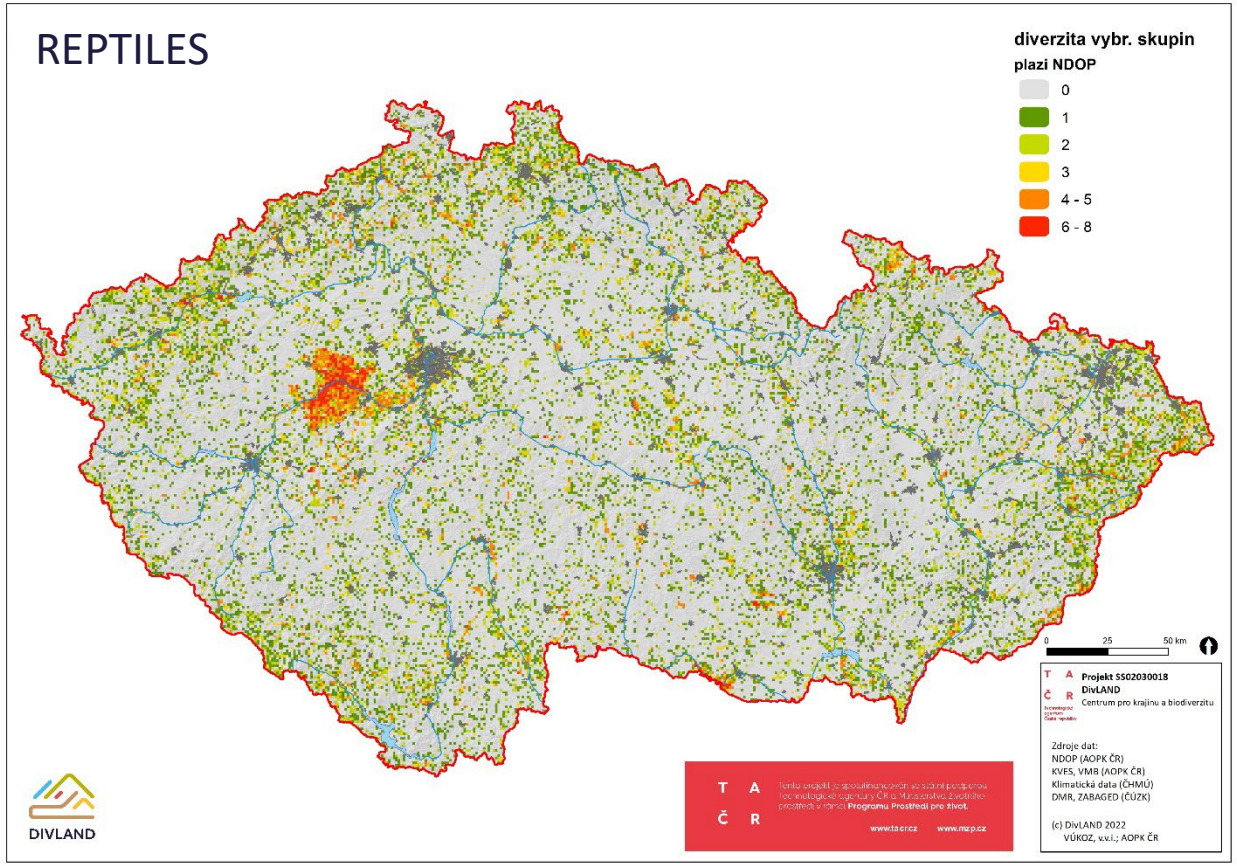
2. **to identify**
   - the potential for increase the total **area of protected areas** (aim 30% of terrestrial ecosystems)

3. **to propose & design**
   - a system for **monitoring indicator species** and the **quality & quantity** of their **habitats**

WP Biodiversity Monitoring & Assessment

- our vision of the **biodiversity pattern** on the **landscape scale** - **driven by monitoring effort**





WP Biodiversity Monitoring & Assessment

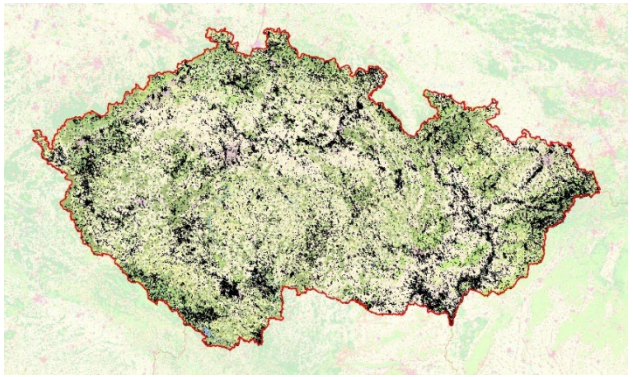
Methodology

- **Assessment of potential biodiversity – *Stacked SDMs***
  1. collection of available data - use of *National Database of Nature Protection - NDOP*, processing (standardization & filtering) of data on the occurrence of **indicator species**
  2. preparation of **environmental variables – BIOMOD-CZ** – databaze of 80 (+40) different predictors
  3. analyses of **basic habitat preferences** of species according to habitat categories
  4. preparation of predictive models (***MIAmaxent***) for relevant species from NDOP
     - *48 species of butterflies, 29 mollusks, 10 amphibians, 9 reptiles, 12 mammals, 71 birds*
  5. comparison of outputs from predictive modelling with the level of current protection
  6. identification of **hotspots of potential biodiversity** and **conservation gaps**

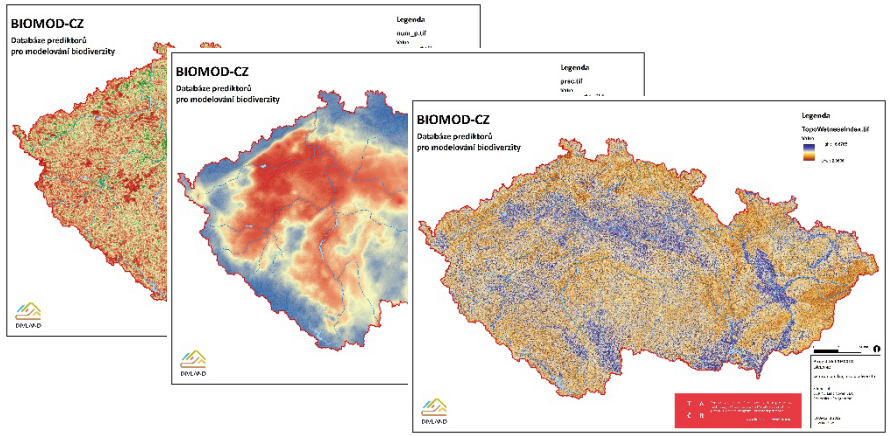
WP Biodiversity Monitoring & Assessment

Methodology – MIAmaxent

Species occurence



Environmental variables



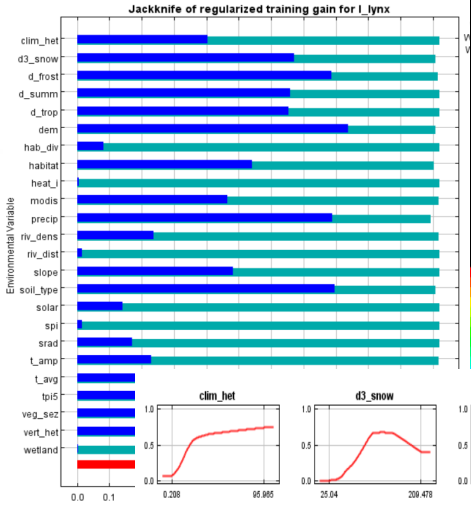
Ecology and Evolution

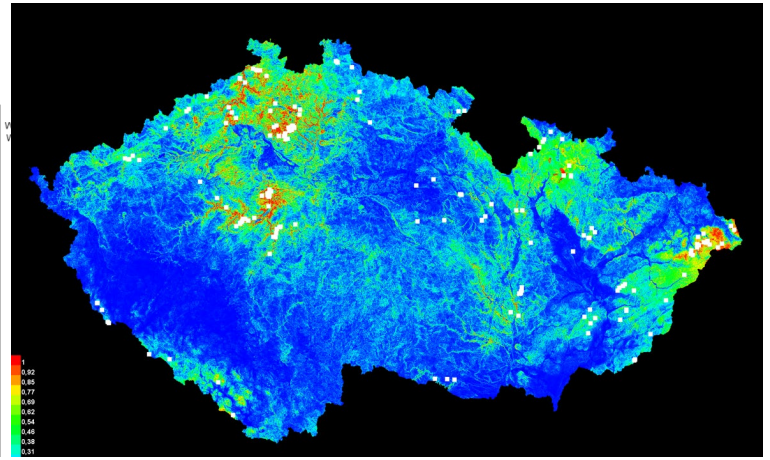
Forward Series

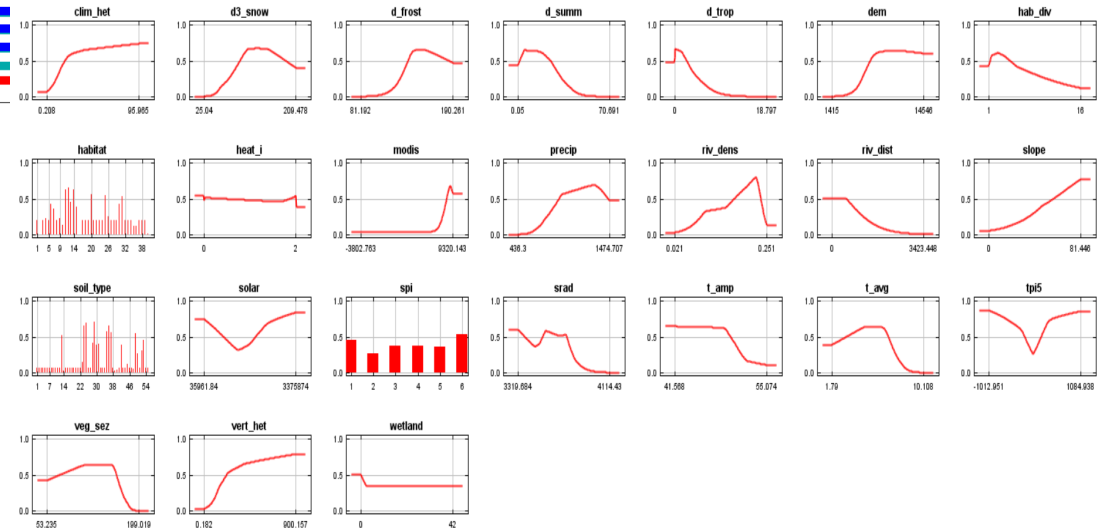
ORIGINAL RESEARCH | Open Access

The MIAmaxent R package: Variable transformation and model selection for species distribution models

Julien Vollering, Rune Halvorsen, Sabrina Mazzoni

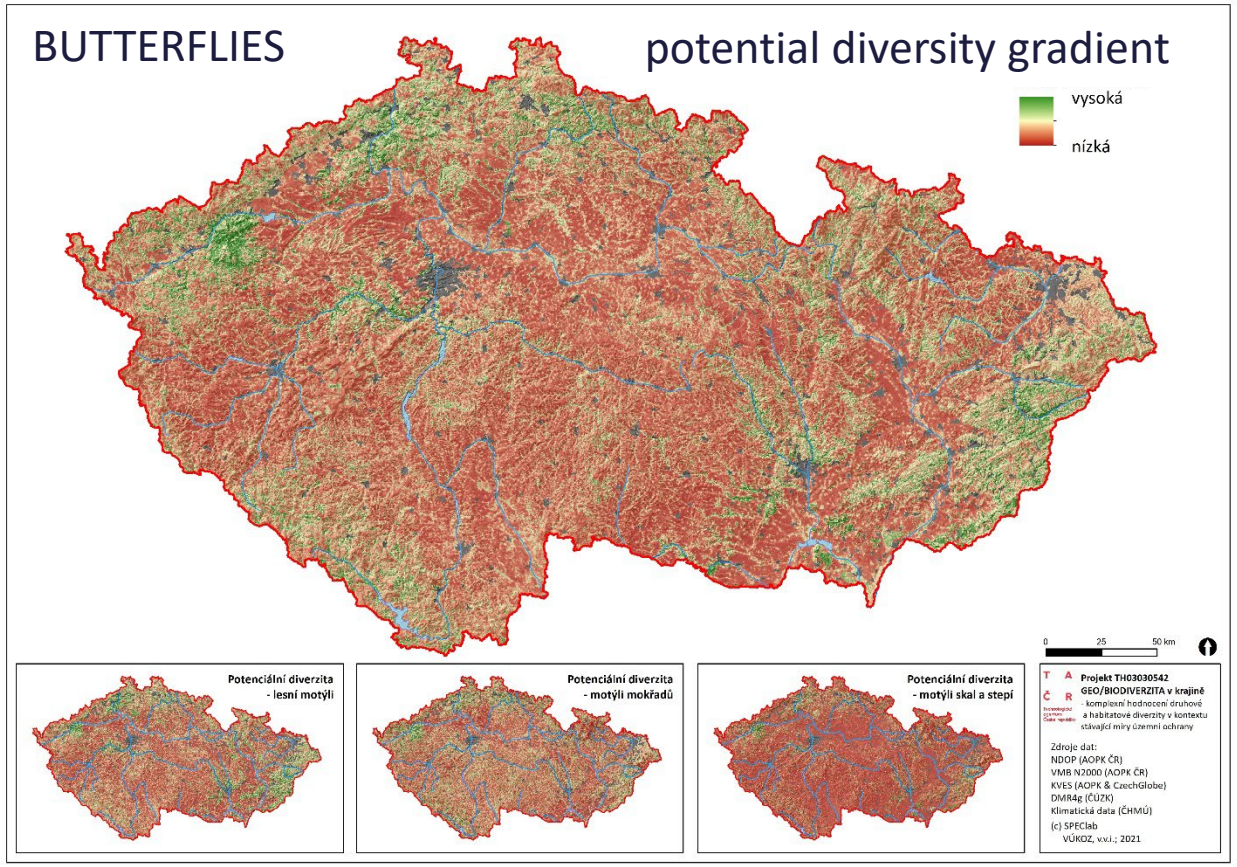


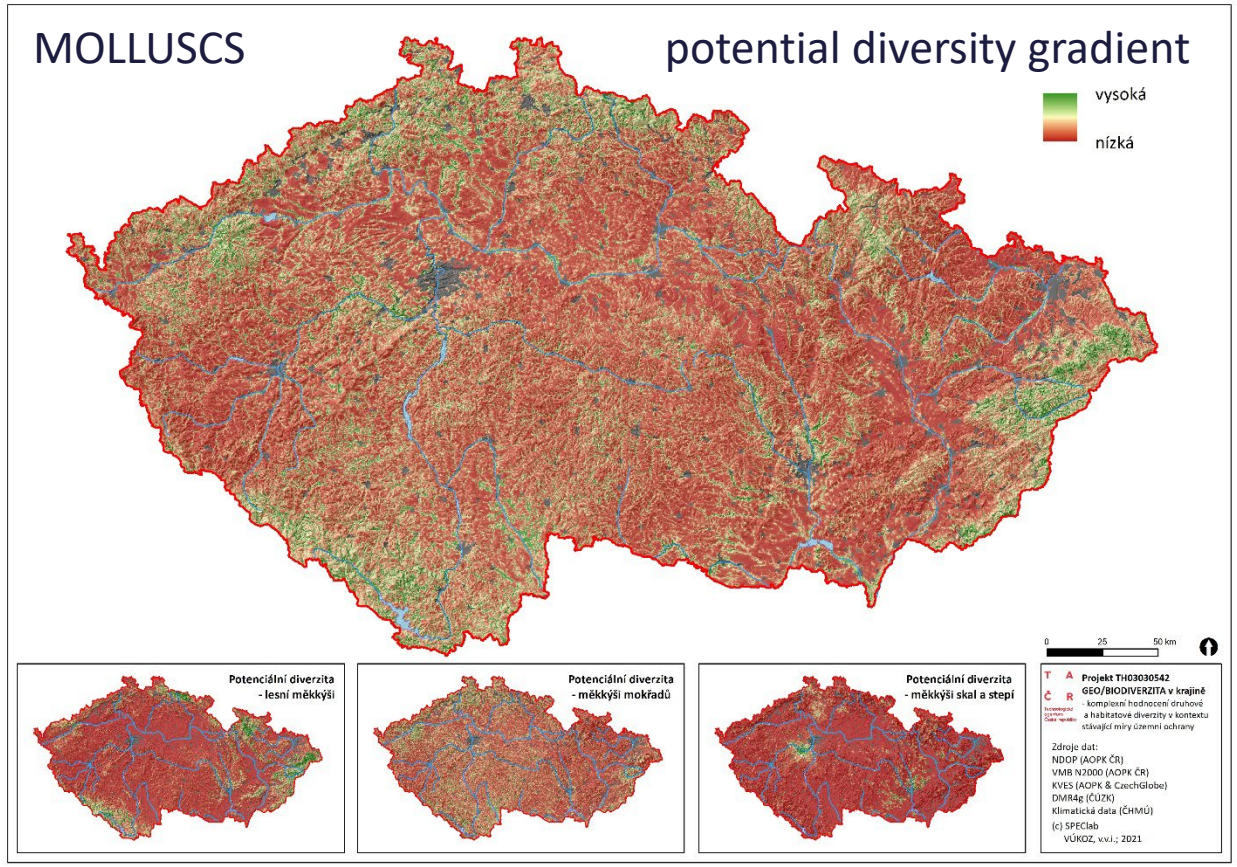




WP Biodiversity Monitoring & Assessment

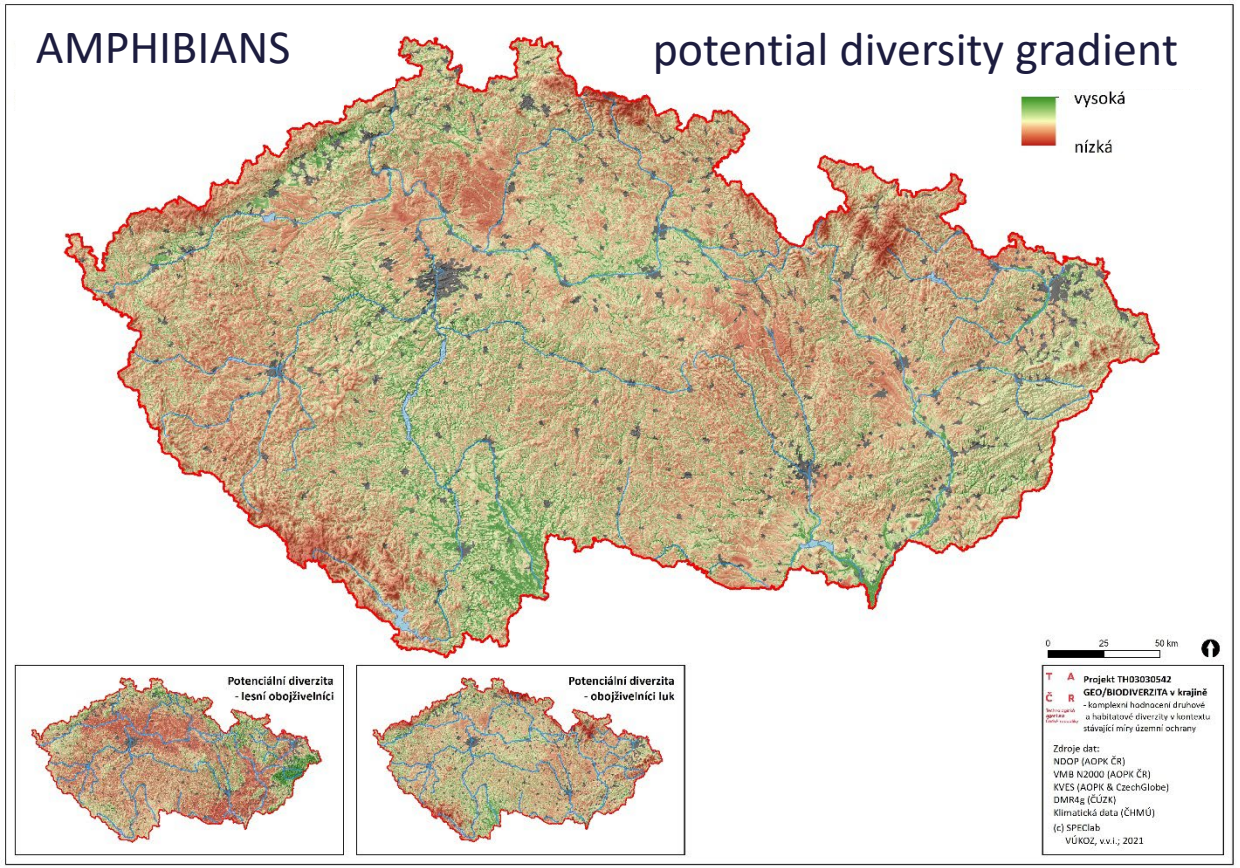
Outputs – datasets of **potential biodiversity** across taxa and functional groups

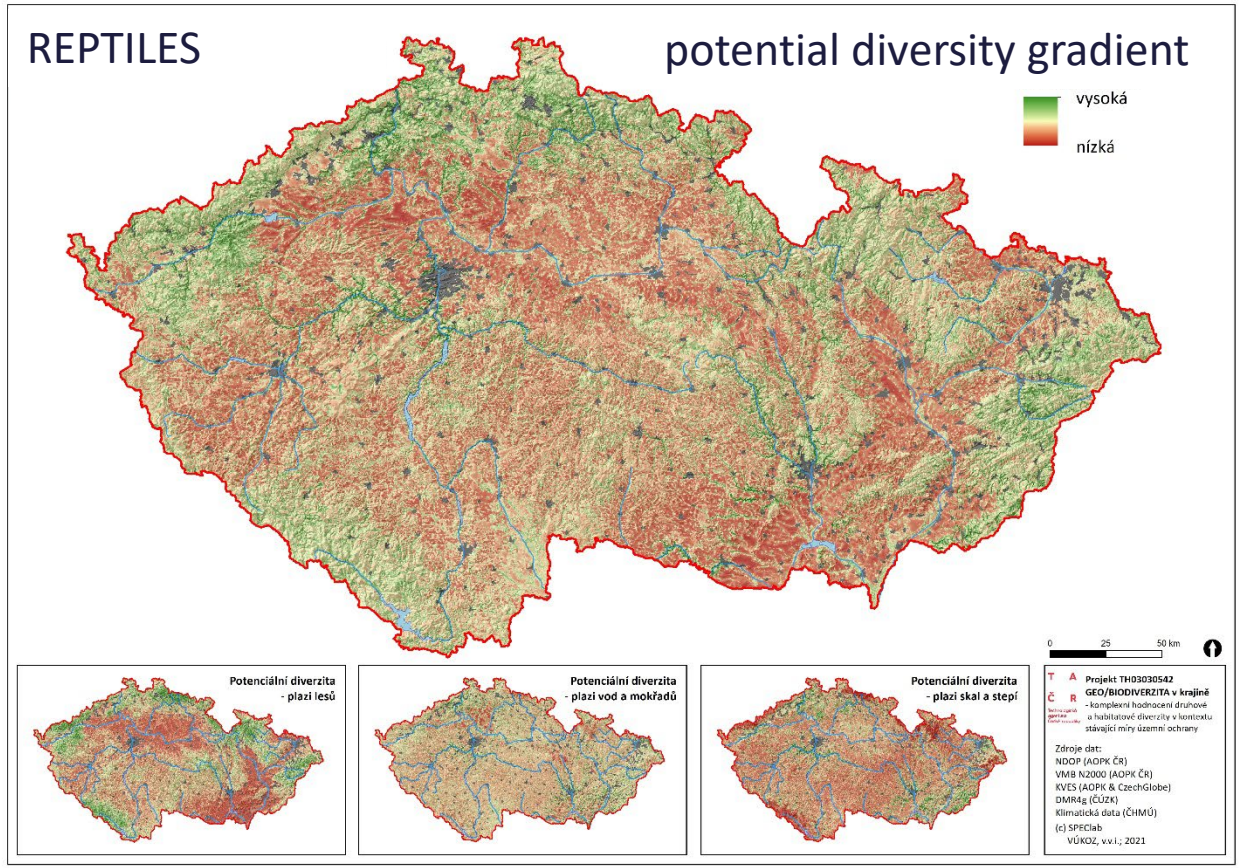




WP Biodiversity Monitoring & Assessment

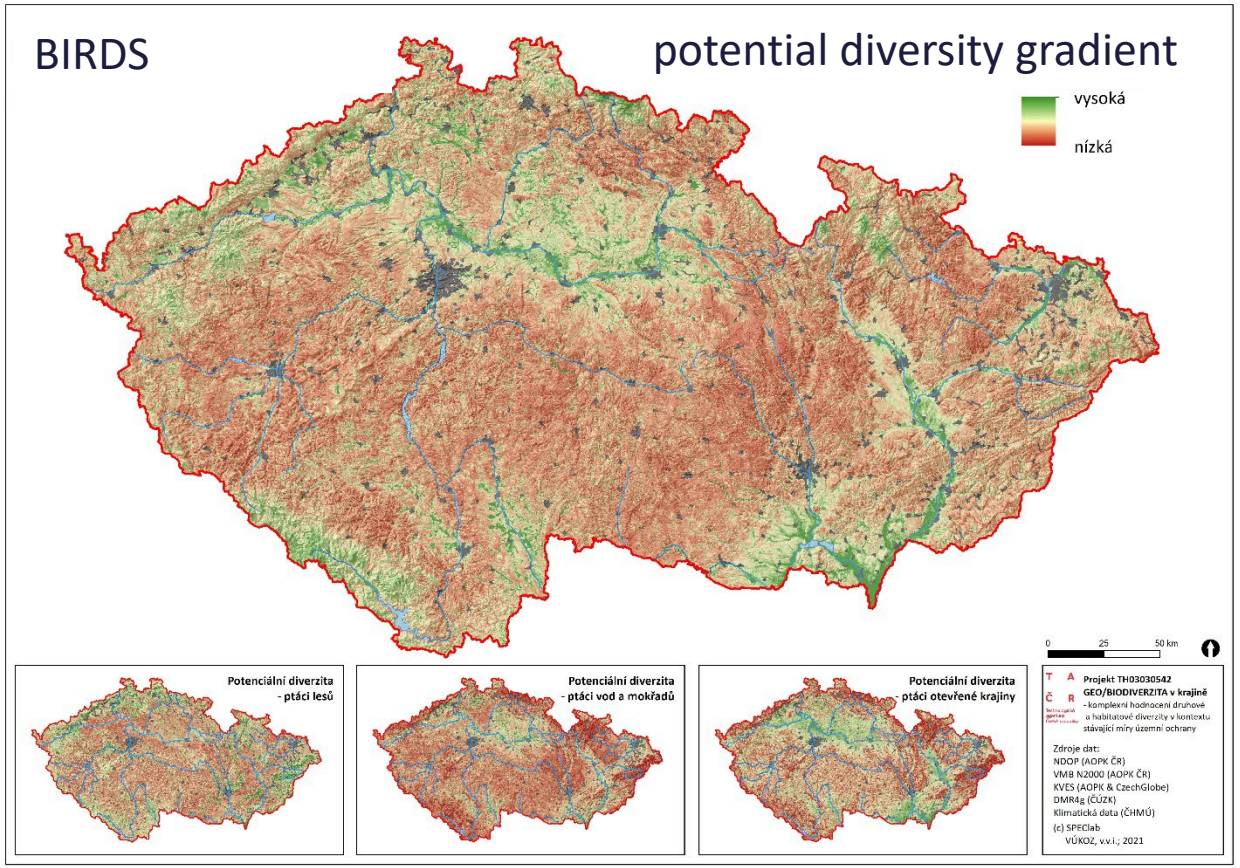
Outputs – datasets of **potential biodiversity** across taxa and functional groups

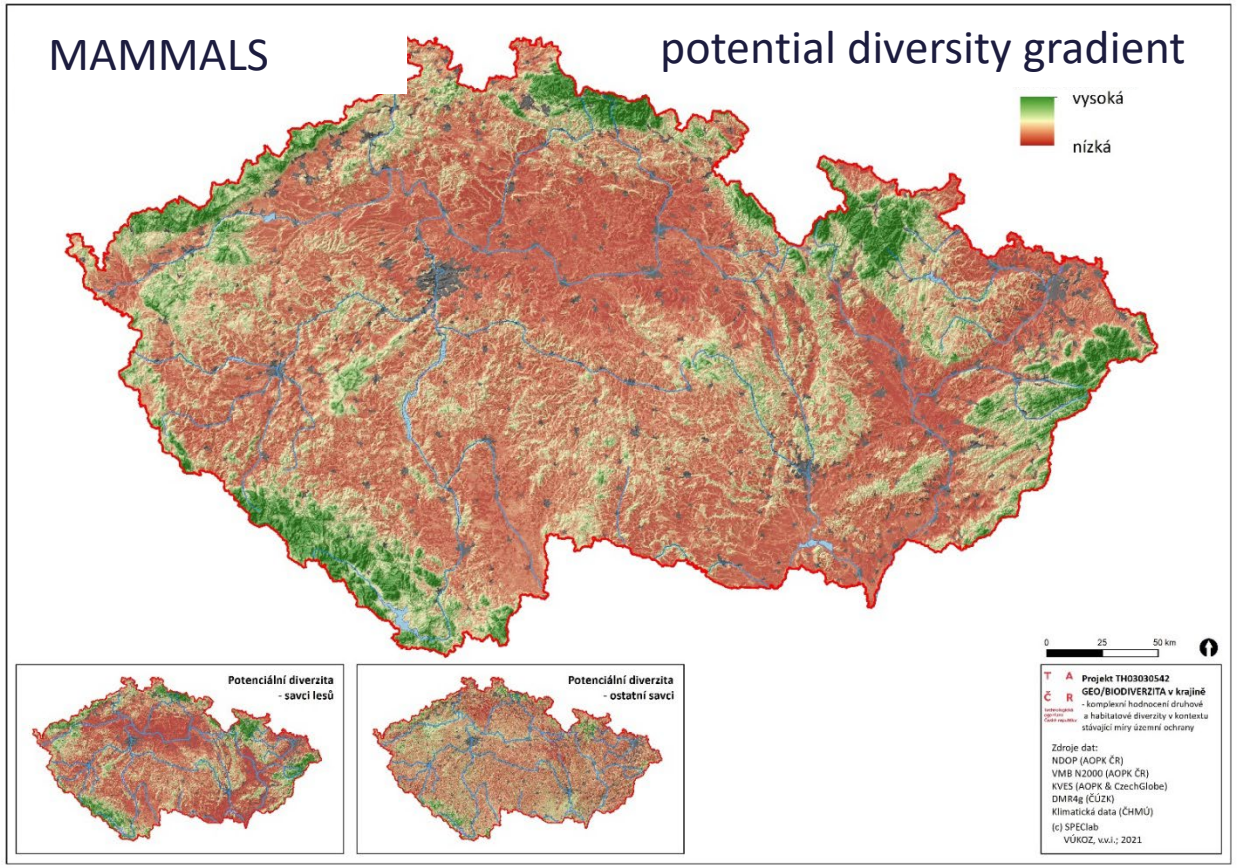




WP Biodiversity Monitoring & Assessment

Outputs – datasets of **potential biodiversity** across taxa and functional groups



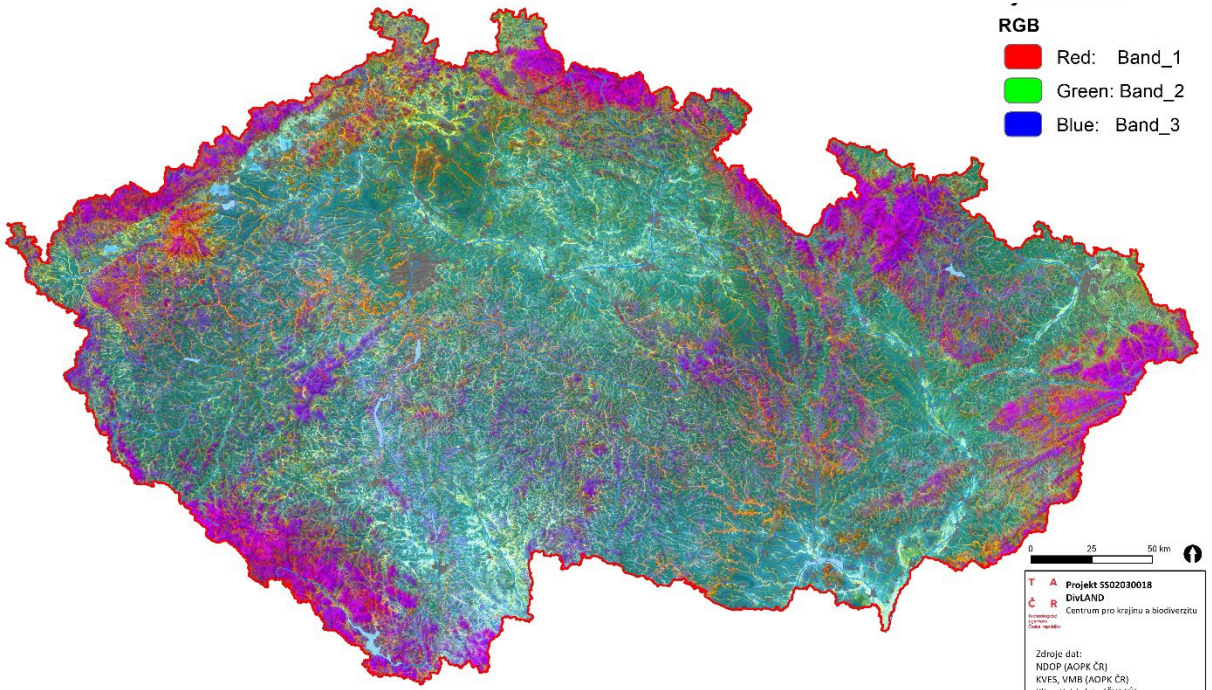


WP Biodiversity Monitoring & Assessment

Outputs - RGB synthesis & cluster analysis

- biodiversity linked to *(homogeneous) forests, heterogeneous mosaic, wetlands,…*

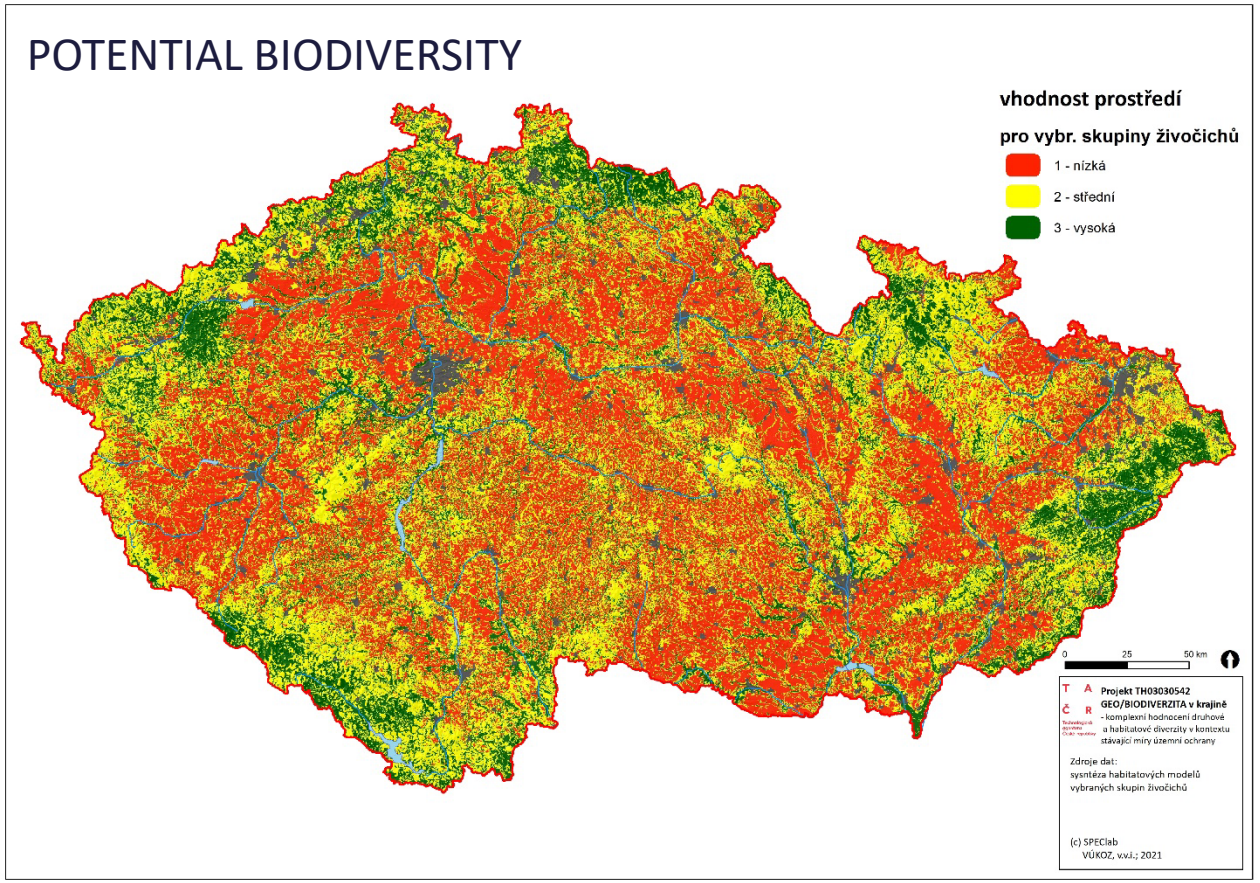
RGB synthesis

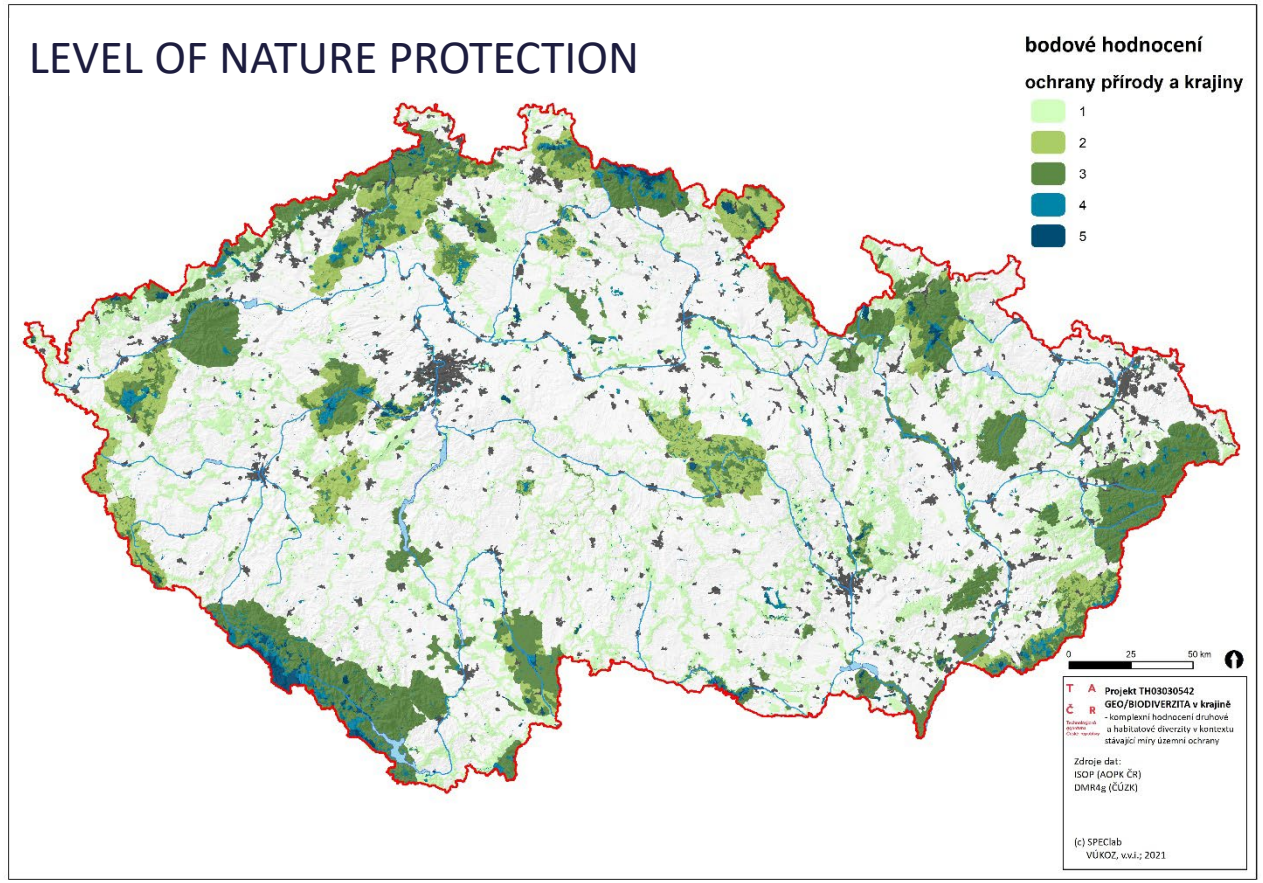


CLUSTERS OF POTENTIAL BIODIVERSITY

WP Biodiversity Monitoring & Assessment

Outputs - combination of potential biodiversity & level of landscape protection



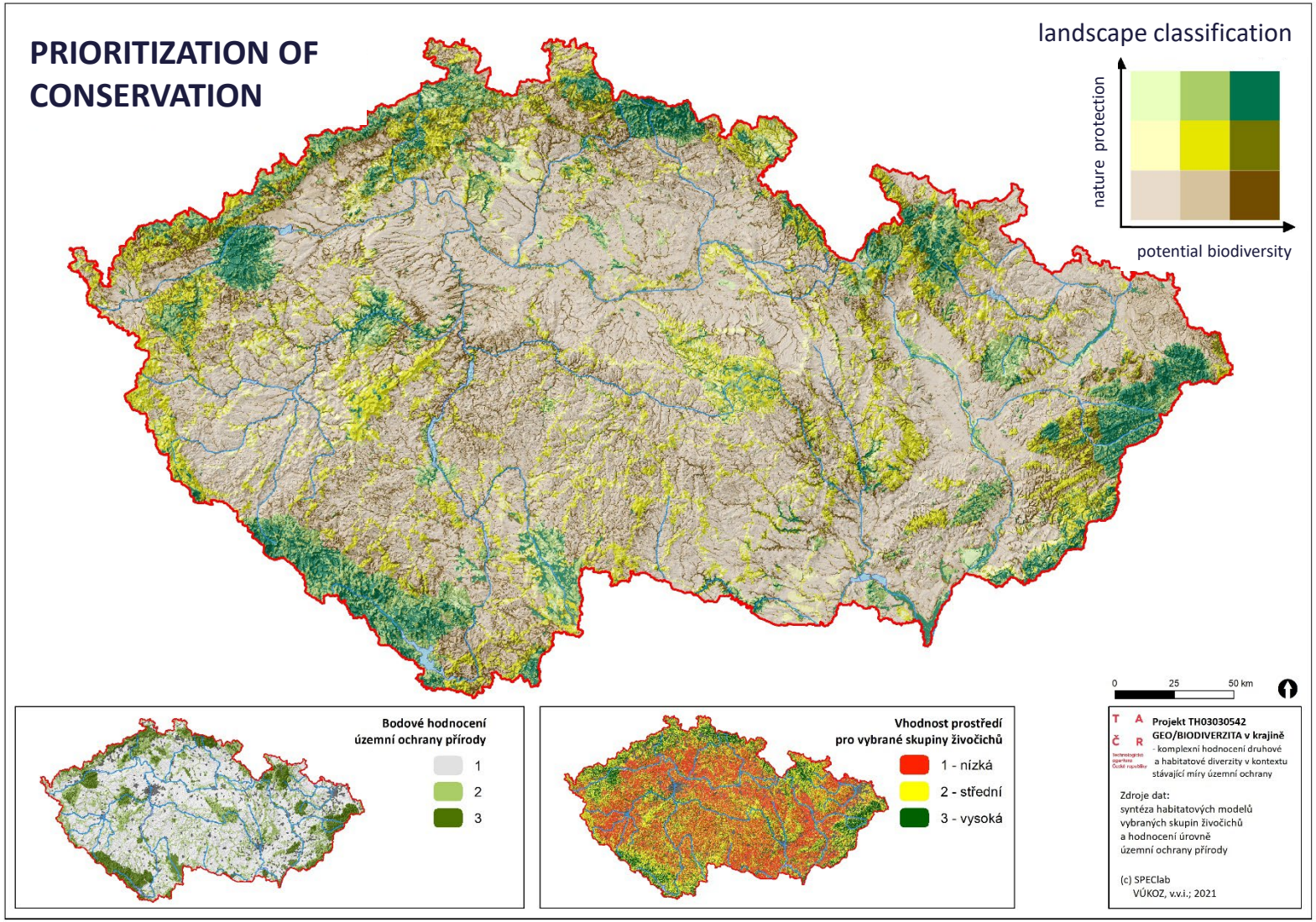


WP Biodiversity Monitoring & Assessment

Output

- combination of the level of current **nature protection** & **potential biodiversity**

- **prioritization of conservation** – basis for decision making of **potential expansion of the network of protected areas**

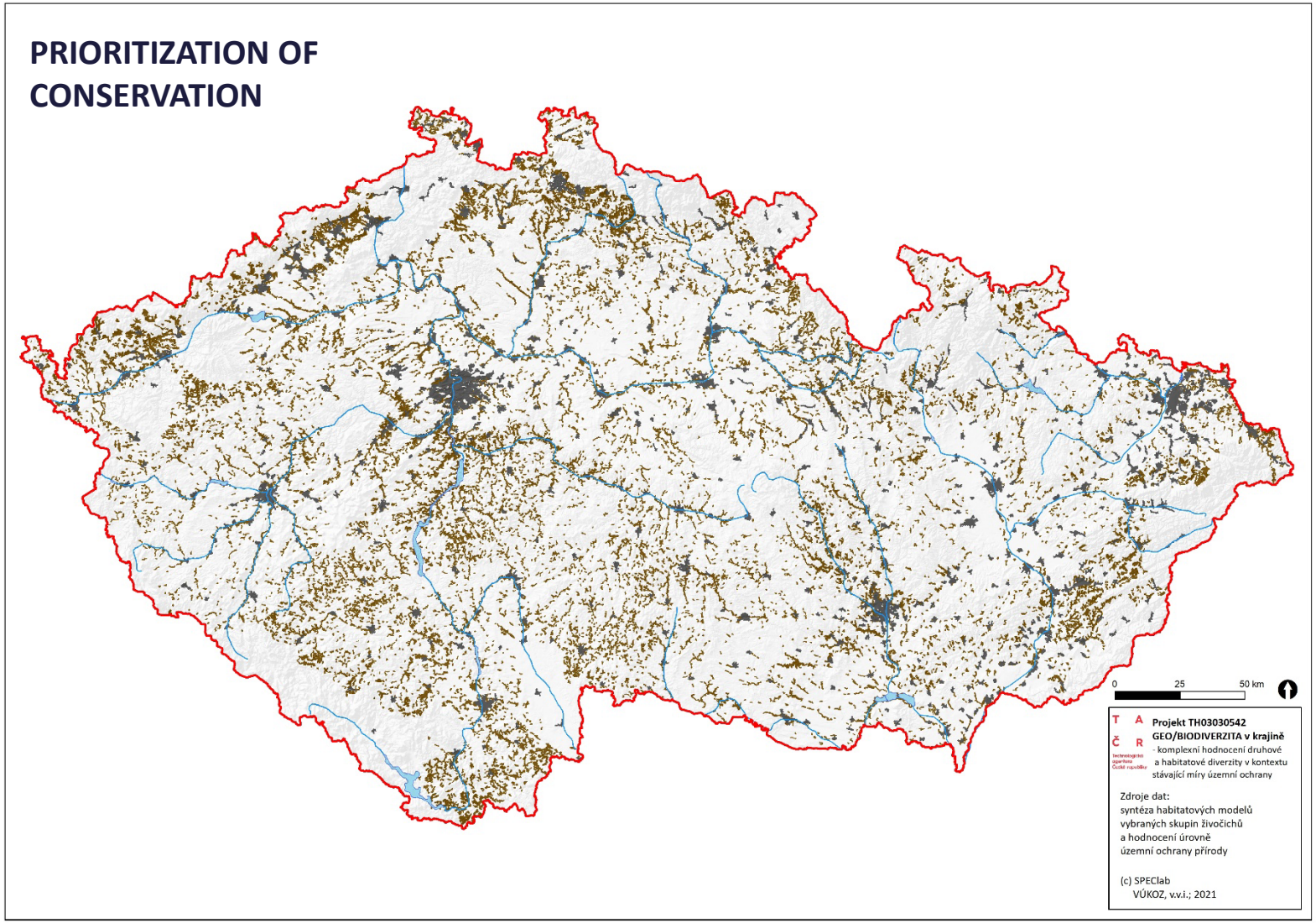


WP Biodiversity Monitoring & Assessment

Output

- combination of the level of current **nature protection** & **potential biodiversity**

- **prioritization of conservation** – basis for decision making of **potential expansion of the network of protected areas**



WP Biodiversity Monitoring & Assessment

Summary

- identification of **8.500 km^2 of potential expansion** of **protected areas network**
- proposal of set of **indicator species** for **intensive monitoring**
- a system for **monitoring indicator species** and the **quality & quantity** of their **habitats**

Thank you for your attention

romportl@vukoz.cz
www.divland.cz

Tento projekt je spolufinancován se státní podporou Technologické agentury ČR a Ministerstva životního prostředí v rámci **Programu Prostředí pro život.**

www.tacr.cz www.mzp.cz